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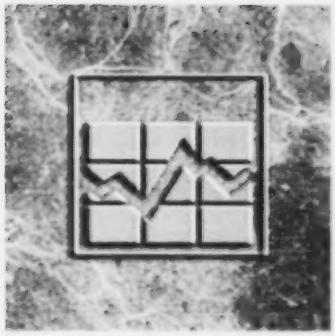
Self/Proxy Respondent Rules and Data Quality



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SELF/PROXY RESPONDENT RULES AND DATA QUALITY

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EXECUTIVE SUMMARY

This paper, as part of the design development process for the Survey of Labour and Income Dynamics (SLID), examines the implications for data quality of accepting proxy responses. While it is apparent that rules that minimize proxy responses add to data collection costs, a review of the existing evidence suggests the effects of proxy reporting on data quality are less clear. The general conclusions of this review are that proxy respondents tended to underestimate participation in government income support programs, be subject to higher item non-response rates and lower rates of personal and household interviews, offer more consistent responses to sensitive subject matter and have greater difficulty in reporting detail and events of short duration. As a result of shortcomings in the design of the research into this question, the evidence is not conclusive. While there is no firm basis for the rejection of proxy responses, the maintenance of some control over proxy responses would be a reasonable strategy.

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1. INTRODUCTION

This review of the literature on respondent rules focuses on the evidence of data quality differences resulting from the acceptance of proxy responses. While the notion that self-responses are more accurate is intuitively appealing, convincing evidence regarding the superiority of self-reporting is absent from the literature [Moore (1988)]. This paper will concentrate on the evidence pertaining to the subject matter concerns of the Survey of Labour and Income Dynamics (SLID) (e.g., the collection of data on labour market experiences and the identification of amounts and sources of household income) and the difficulties that this source of potential response error presents for longitudinal surveys (e.g., the "seam" problem, overestimation of transitions due to response errors).

The paper will be organized according to the methods used by different studies in attributing quality differences to respondent status. This structure will emphasize the methodological deficiencies associated with this research. (Many studies do not either control for sample selection biases or have some external standard to judge the comparative accuracy of proxy and self-responses.) By keeping these deficiencies in the forefront, it makes clear that this paper does not dispute the general claim of Moore's that there is little definitive evidence of quality differences. The paper does, however, try to look for some indication of where respondent status may be of concern to the quality of SLID data. A summary of these results is provided in Appendix 1.

Before proceeding with an overview of the results, a brief discussion is appropriate into two of the more common deficiencies of the research in this area. Firstly, much of the research does not control for self-selection bias that occurs when the differences between proxy and non-proxy responses reflect the different characteristics possessed by the populations which are available to be interviewed and those which are not. For example, greater incidence of employment reported

by proxy may be better attributed to the reduced likelihood of the working population being at home than to possible errors in proxy responses. A method which overcomes this bias, hereafter called the experimental approach, obtains two responses -- one self-response and the other proxy -- to the same questions within the same household.

A second difficulty in assessing the relationship between response error and reporting status is that inconsistent responses from different types of respondents does not provide proof of which is the better response. Validity studies, by offering some external measure of accuracy (usually from administrative data), enables a more definitive evaluation of data quality.

2. EXPERIMENTAL APPROACH

1. The Income Survey Development Program (ISDP) was the research and development phase of the Survey of Income and Program Participation (SIPP). It examined, among other issues, the effect of respondent status on data quality. One experiment involved interviews with students living outside the parental household and reinterviews with proxy respondents within those households [Roman and O'Brien (1984)]. The small sample size (167 matched records), the loss of 35 records due to a processing flaw, the high survey non-response rate and the lack of an external standard of validity makes the following results tentative:

- In 25% of cases, the proxy failed to identify wage and salary information (collected by job) that was given by a self-respondent for a three month reference period. In contrast, the amount of potential overreporting of job incidence by proxy was less than 3%.

- Self-respondents were more likely to provide a response than proxies especially for primary job characteristics like hours per week and hourly wage (99% rate versus 75% response rate for proxies). The only significant difference in **values** were for these same two variables (in both cases, proxy mean responses were higher).

- Proxies were more likely to report on jobs which were associated with higher wages and numbers of hours worked (saliency appears to be a factor).

2. The Interviewer Methods Survey (U.K.) examined self-responses with the proxy responses of other adults in the same household [Martin and Butcher (1982)]. The sample consisted of 999 households and 1324 paired responses, 70% of which were husband and wife pairs. Results given below deal with husband-wife pairs only.

- **Employment** variables such as class of worker, occupation (222 codes), timing of pay periods and hours worked last week (3 codes) had less than a 10% disagreement rate. Days worked last week had the highest rate of disagreement at 16%. The percentage of proxies who stated no knowledge of these variables was less than 5% with the exception of hours worked last week (9%).

- The **income** variables used were gross and net figures for **total** income from all sources for the year or reference week. These variables showed more inconsistency and a higher proportion of proxies who did not know the answers. The extent of disagreement depended largely on the level of detail asked. Income responses requiring accuracy to £1 per week had a disagreement rate of over 65% while responses coded to £50 income bands

had a rate of 20%. Confessed lack of knowledge of spousal income was 20% and was not seriously affected by the level of detail of the response categories provided.

! The percentage of disagreement between proxy and self-reports of income **increases** with the level of income -- a relationship that is only partially mitigated by the use of income bands which increase with income.

! **Housing** variables (tenure, length of residence) showed a high degree of correspondence between proxy and self responses. However, rent or mortgage payments (allowable margin of error was £1 per week) were inconsistent in 20% of the cases and proxies stated no knowledge in another 12%.

3. VALIDITY STUDIES

Unlike the previous two studies, the following do not control for self-selection bias but do use administrative data to determine the relative accuracy of proxy and non-proxy responses. The SIPP Record Check used program participation records for eight government programs to evaluate the quality of participation data in the first two waves of SIPP [Moore (1990)]. The results on error rates by respondent status (sample size of over 5000) indicated that:

! Proxy responses tend to contain more underreporting errors in monthly participation although this trend was not uniform and differences were not statistically significant in a majority of cases. Self-respondents made more overreporting errors but significant differences were few.

- In terms of changes in program participation, differences in overreporting of within wave changes (despite large sample sizes) were not statistically significant and were directionally mixed. (Proxy response errors were here defined as any proxy participation in either of the two waves -- change from one type of respondent to another was not examined separately.) The incidence of underreporting errors was small enough to effectively preclude any statistically significant evidence.

- Proxy / non-proxy differences in errors related to overreporting participation changes at the seam yielded no significant results (once again with large sample sizes) and no consistency in the direction of the differences across the eight programs.

- Moore (1990) also found no significant evidence that length of recall period (4 months as opposed to 1 month ago) differentially affected error rates of proxy responses more than self-responses.

4. NONEXPERIMENTAL, INCONSISTENCY OF RESPONSE APPROACH

The following assessments of proxy information are based on either the degree of correspondence between naturally occurring self- and proxy-responses or response consistency through time by respondent status. These studies provide no controls for self-selection bias based on the availability of the respondent nor is there any external standard to judge the relative validity of the two types of responses.

1. Labour Force Survey (LFS) Reinterview 1980-84

Conducted on a 2% subsample of the Canadian LFS, the reinterviews with knowledgeable household members were done with different interviewers and a one week time lag. Comparisons of response variance by respondent status were made for a subsample in which the original response was not available to the interviewer. The usefulness of some of these results for longitudinal studies is lessened by the short recall period associated with most of the questions. The general conclusions reached by Lemaître (1986, 1991) were:

- No uniform relationship was evident between proxy responses and inconsistency of response. Some "threatening" questions (e.g., reasons for work absence, existence of job search) were more consistently reported by proxy (both same proxy and mixed proxy/non-proxy response). One of the two questions involving the recall of dates (date started work) was more consistently responded to by those answering for themselves. (The other question which asked for the date last worked could reasonably be considered in the category of "threatening".) Given the importance given to dates in SLID, this may be of some concern, although for these cases, response inconsistency was considerable for both proxy and self-reporters.

- For most questions, inconsistency rates for response pairs in which there was a **change** in respondent status (e.g., from proxy to self response) were only marginally higher than in cases where there was no change.

- In comparing the distributions of responses where there was a change in respondent status, no significant proxy effect was found for any variable.

2. Labour Market Activity Survey (LMAS) Analysis

In an analysis of the "seam" problem in the LMAS, the possible impact of respondent status on the incidence of unconfirmed jobs was examined [Murray et al. (1991)]. Unconfirmed jobs were those that were reported as being held at the end of one reference period, but were not subsequently reported at the beginning of the next reference period. A limited proxy rule was in effect whereby the interviewer assessed the ability of the proxy respondent based on the degree of complexity of the work pattern being asked. If necessary, a second contact was made in order to obtain a self-response. The results showed that unconfirmed jobs comprised 2.0% and 1.6% of total reported jobs for proxy and non-proxy respondents respectively. The low rate of unconfirmed jobs for proxies may be partially attributed to the aforementioned proxy rule. From these data, there was no support for the claim that proxy reporting was a contributing factor to the "seam" problem.

3. Income Survey Development Program (ISDP)

In another examination of the relative quality of proxy responses, the ISDP looked at naturally occurring differences in the item nonresponse rates of proxy and self-respondents (i.e., did not control for self-selection bias) [Coder (1980)]. Standard errors were not calculated and thus the statistical significance of results is unknown. Results showed that proxy respondents had consistently higher nonresponse rates for all income sources reported. Particularly disconcerting was that almost one quarter of proxy respondents did not supply hourly wage rate information compared to a nonresponse rate of 5% for non-proxies. Non-response rates were highest for self-employment income (50% and 60% for self- and proxy-respondents respectively).

In a controlled experiment, households were randomly assigned to two samples of equal size which differed in terms of respondent rules. The subsample that operated under a self-response-only rule had a lower interview rate than an approach which accepted proxies, although the data supporting this assertion were not provided [Coder (1980)]. It should be noted that Moore (1988) acknowledges that "it appears that self-response procedures produce higher household and person non-interview rates. Overall completeness may be equivalent, however, since these differences seem to be balanced by lower item non-response under procedures to maximize self-response.

Data from the same ISDP experiment also showed that the subsample which followed a strict self-response rule had higher data collection costs (by 4% to 6%) and a higher proportion of self-responses (by about 20%) than for the group subject to standard proxy treatment. Aside from lower item non-response, evidence of better quality data from the self-response group was based on observations that self-reporters made greater use of records and their income amounts were not rounded to the same degree [Kulka (1984)].

4. Survey of Income and Program Participation (SIPP)

Similar discrepancies in item nonresponse by respondent status were found in the 1983 SIPP data [Coder and Feldman (1984)]. In particular, nonresponse rates were higher for proxy respondents for monthly wage and salary income, monthly self-employment income and hourly wage rate information with nonresponse rates at 22% for proxy reporters and 10% for self-respondents.

Weidman (1986) examined the relationship of respondent status and the discrepancy in gross changes in program participation between waves and within waves (i.e., the "seam" problem). The proportion of between wave transitions was

found to be higher when a proxy response was given for at least one of the two consecutive months. Also, there were fewer reports by proxies of income received from programs. The proxy effect on the "seam" problem was not considered "noticeable" - no statistical tests were reported.

In another nonexperimental study, item nonresponse rates in SIPP were found to be almost uniformly higher for proxy reporters [McMillen (1990)]. In general, there were considerable differences in non-response rates with 13 out of 36 income categories having proxy nonresponse rates over twice those of self-respondents. These categories included wages and salaries, food stamps and child support payments.

5. U.S. Current Population Survey (CPS) Reinterview

As part of a regular check on data quality, a subsample of 5000 households are reinterviewed. These interviews are conducted by a different, more-experienced interviewer. For 20% of this subsample, the original response was not available to the interviewer and the following results are based on these unreconciled cases over a two-year period. Variables examined here deal with labour force and employment status which are not directly obtained, but are coded on the basis of answers to questions about respondents' activities.

Across all variables, inconsistency rates were lowest (2% to 4%) when no proxy response was involved and highest when the responses were provided by two **different** proxy respondents (6% to 12%) [O'Muircheartaigh (1986)]. No mention is made of the statistical significance of these differences. O'Muircheartaigh estimates that rates for those situations when the respondent did not change may be understated by 30% to 50% as a result of between-trial correlation (i.e., identical response as a result of respondent remembering past

answer). The mixed response pairs (i.e., one proxy and one self-response) had inconsistency rates of 3% to 7%.

Further analysis was done on the response pairs in which respondent status did not change. In the classes of subjects that comprised virtually all of the sample (heads of households, wives of heads, other relatives), the proxy responses were more consistent. This is compatible with their general finding that self-responses had greater consistency since the subject class that had the highest rate of inconsistency (other relatives) was almost exclusively reported on a proxy basis. It should again be stressed that consistency of responses does not provide any information regarding the accuracy of the answers (i.e., proxies may be giving consistently wrong answers). As well, it should be recognized that in this study, as in other nonexperimental studies reviewed here, there is some control exercised by interviewers in the selection of respondents [O'Muircheartaigh (1986)]. The requirement that proxies are knowledgeable may be an effective quality filter and reduce any observed quality differences.

5. DISCUSSION

While in general there is no compelling evidence which suggests significant quality differences between self- and proxy-reporting, the above results indicate some areas of concern. In studies using different methods, proxy respondents tended to underestimate participation in government income support programs, be subject to higher item nonresponse rates and lower rates of personal and household interviews, offer a more consistent set of responses to sensitive subject matter and have greater difficulty in reporting both precise details and events of short duration. Given the methodological shortcomings of the research to date, the different characteristics of proxy response rules examined and the statistical insignificance of proxy effects on various data quality indicators, these findings are

more speculative than substantial and are not a solid basis for choosing one set of respondent rules over another. In any case there are other considerations -- most notably the higher costs associated with strict self-response rules.

Some reasons for the paucity of unequivocal evidence concerning data quality differences have been suggested. Moore (1990) notes that the superiority of self-respondents in the amount and the saliency of the knowledge requested may not be utilized in the interview situation. Instead of retrieving information from memory, both types of respondents may be estimating on the basis of "superficial knowledge fragments, [and] highly fallible rules". The severe time constraints faced by respondents in the interview process may be largely responsible for this non-systematic retrieval of information. A more direct but perhaps less plausible explanation is that the relevant information is conveyed to the proxy respondent for the purpose of responding to the survey [Lemaître (1992)]. This would occur, for example, when the subject of the question is present during the interview and provides the answer to the proxy.

If proxy reporting is allowed and there is concern over the data quality implications, identifying knowledgeable proxies would be helpful. One suggestion is to use a small number of screening questions to assess proxy competence. These questions might deal with the degree of discussion within the household about the relevant subject matter and the level of confidence the proxy has in his (her) answers [Sudman et al. (1990)]. This would be a more formal type of proxy control than used in the LMAS where the interviewer was responsible for judging whether the complexity of work patterns would preclude reasonably accurate proxy reporting. Another suggested solution is that there may be some advance communication with the potential respondent concerning questionnaire content [Lemaître (1991)]. However, advance notice of a volunteer survey which asks

detailed questions about amounts and sources of income may adversely affect interview response rates.

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APPENDIX 1

QUALITY DEFECTS ASSOCIATED WITH PROXY RESPONSES

Quality Defects Associated with Proxy Responses

Item	Quality Differences	Method	Source
# of income sources	17% inconsistency rate between proxy and self-respondents	E	Martin and Butcher
# of jobs	25% rate of underreporting by proxies for a three-month reference period	E	Roman and O'Brien
Looked for work in last six months	Inconsistent rates for proxy respondents were twice as high as for self-respondents	NE	Lemaître (1986)
Reason could not take another job	Higher rates of inconsistency for proxy reporters	NE	Lemaître (1986)
Hourly wage rate	Nonresponse rates over four times higher for proxy reporters (23% as opposed to 5% for self-reporters)	NE	Coder
	Nonresponse rates were three times higher for proxy respondents	NE	Coder and Feldman

E = experimental design that controls for self selection bias
NE = non-experimental research design that does not control for self-selection bias
V = validity study which uses administrative data to check response accuracy

Social security, Pension income	Nonresponse rates three times higher for proxies	NE	Coder
	Nonresponse rates for proxies almost twice that for self-respondents	NE	McMillen
Monthly wage and salary income	Nonresponse rates twice as high for proxies	NE	Coder and Feldman
	Nonresponse rate over twice as high for proxy reporters	NE	McMillen
Monthly self-employment income	Nonresponse rate twice as high for proxy reporters	NE	Coder and Feldman
Income support program participation	Greater underreporting of AFDC, food stamps and workers' compensation by proxies (statistically significant at 5% level for at least one of the two waves reported)	V	Moore (1990)
Alimony payments	Nonresponse rate for proxies twice that for self-reporters	NE	McMillen

E = experimental design that controls for self selection bias
NE = non-experimental research design that does not control for self-selection bias
V = validity study which uses administrative data to check response accuracy